SECTION 15111
PROCESS (WASTE) DRAIN (PD) PIPING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

A. This Section includes Polypropylene (PP) plastic piping systems for process and chemical waste drain service with up to 180°F (82°C) maximum temperature and from gravity type up to 150-psig maximum pressurized piping systems:
   1. Process (Waste) Drain (PD) materials and equipment.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 15, Section 15050, Piping Systems
   2. Division 15, Section 15072, Cleaning
   3. Division 15, Section 15073, Pressure/Leak Testing
   4. Division 15, Section 15074, Identification and Labeling
   5. Division 15, Section 15110, Process Waste Drains Outside Buildings

1.3 REFERENCES

A. Southern Building Code Congress International Inc. (SBCCI).
   1. SPC (1997) Standard Plumbing Code.

B. American Society for Testing and Materials (ASTM)
   1. ASTM D 4101 (1996), Standard Specification for Propylene Plastic Injection and Extrusion Materials.
   2. ASTM F 1412 (1997), Standard Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage Systems.

C. American National Standards Institute (ANSI).

D. The American Society of Mechanical Engineers (ASME).

E. National Fire Protection Association (NFPA).
   1. NFPA 70 (1996) National Electrical Code (NEC)

1.4 DEFINITIONS

A. PP: Polypropylene plastic.

1.5 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Non-pressure-Piping Pressure Rating: 10-foot (3-m) head of water.

B. Gravity-Flow, Double-Contained-Piping Pressure Rating: 5-psig (34.5-kPa) air test pressure.

1.6 SUBMITTALS

A. Product Data: For chemical-waste piping materials, components, and specialties. Indicate dimensions, required clearances, methods of assembly of piping components, and piping accessories.

B. Submit six (6) copies of the following to the Construction Manager:
   1. Design Data: Indicate in sufficient detail to verify that products meet or exceed specified performance requirements.
   2. Certificates: Certify that products meet or exceed specified performance requirements.
   3. Manufacturer's Instructions: Indicate installation and support requirements.
   4. Shop drawings: Provide large-scale (Scale of ¼" = 1'-0" minimum) layout drawings, indicating all relevant equipment associated with routing of piping.
      Shop drawings shall be "spool" type that includes all piping connection joints, fittings, hangers, supports required and relevant details as required.
   5. Coordination Drawings: Include relationship to other services that serve same work areas.
   6. Certificates of Shop Inspection and Data Report: As required by ASME Boiler and Pressure Vessel Code.
   7. Maintenance Data: For equipment to include in the maintenance manuals as specified in General and Supplementary Conditions.

C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.7 QUALITY ASSURANCE

A. Source Limitations: Obtain pipe, fittings, and joining materials for each piping system through one source from a single manufacturer. Piping materials shall bear label, stamp, or other markings of specified testing agency.
   1. Exception: Piping from different manufacturers may be used in same system if indicated and suitable transition fittings matching both piping materials are used.

B. Product Options: Drawings indicate size, profiles, and dimensional requirements of chemical-waste specialties and are based on the specific system indicated.

C. Piping materials shall bear label, stamp, or other markings of specified testing laboratory.

D. Electrical Components, Devices, and Accessories: Comply with NFPA 70.
   1. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction, and marked for intended use.

E. Comply with ASME B31.3, "Process Piping."

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver and store piping and specialties with sealing plugs in ends or with end protection.

PART 2 - GENERAL

2.1 PROCESS WASTE DRAIN MATERIALS

A. Use materials selected from list below for new systems.

B. Floor Drains and Traps: Shall be of Polypropylene (PP) furnished with fuseal heat fusion joints, sediment bucket, and grate.

C. Floor sink: Shall be polypropylene finish with bucket and strainer. Sink shall be 7 inches square (min.)

D. Cleanout: ANSI A112.36.2M; Provide threaded Polypropylene (PP) cleanout plugs.

E. Sump Pump: Shall be duplex, self contained pumps, all plastic Polypropylene (PP) construction, stainless steel fasteners, pump motor-epoxy coated TEFC weather resistant motor with drop shield, and power interrupt pump down reset. See drawing for sump pump and basin schedule.

F. Valves: 4 inches and smaller shall be Class 150 PP construction. Shut-off valves shall be true-union ball valves, check valves shall be swing-type.

G. Process (Waste) Drainage (PD) Piping:

1. Above grade:

   a. Gravity piping and fittings (with threaded or fused joints) above-grade to sump-pump or collection tank shall be Schedule 40, Flame retardant, Polypropylene (PP), conforming to ASTM D2837-85 for non-pressure rated applications.
   *** Under-bench at Laboratory sinks and Tailpieces in the CNMS building, mechanical joints shall be utilized where speed of installation, future disassembly or modular design is required.

   b. Pressure piping and fittings (fusion joints) above-grade such as pumped discharge, shall be Schedule 40, Polypropylene (PP), conforming to ASTM D4101-86, SDR11, rated for 150 psig operating pressure at 73.4 degree F.

2. Below grade:

   a. Gravity piping and fittings (with fused joints) below-grade to sump-pump or collection tank shall be Schedule 40, Non-Flame retardant, Polypropylene (PP), conforming to ASTM D2837-85 for non-pressure rated applications.

   b. Pressure rated PP piping and fittings below-grade shall be the same as specified for above-grade application.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install piping system per Standard Plumbing Code.

B. Slope lines to have a minimum pitch of 1/4 in./ft., unless otherwise noted.

C. Support vertical lines at maximum intervals of 10 ft. Maximum horizontal intervals for Polypropylene (PP) pipe is 3 ft. 6 in, longer intervals will be allowed provided the pipe meets the recommended manufacturer installation requirements for a given pipe size.

D. Install cleanouts flush with floor with long sweep 1/4-ends or 1/8-bends extended to floor level in location shown on drawings. Caulk cleanout plug assembly with countersunk cleanout plug into hub of fitting with plug face flush with floor.

E. In other cases, form cleanouts by using tee or "Y" pattern branch fittings with screw plugs of the same size as the pipe up to and including 4 in.

F. Install cleanout plugs at foot of new vent stacks.

G. Identification/Labeling: Section 15074.

3.2 FIELD QUALITY CONTROL

A. Pressure/Leak Test: Section 15073, Class C.

3.3 CLEANING

A. Clean piping systems per project specifications, Section 15072, Cleaning.

END OF SECTION 15111